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AVOCADO ROOT ROT

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Avocados (Persea americana Mill.) are grown extensively in nurseries and are widespread in commercial and home plantings in south Florida. Increased urbanization in south Florida, consumer popularity of the fruit, and recent breeding programs for cold-hardiness (3), will eventually spread the avocado industry to more northern climes of Florida. Avocado root rot, caused by Phytophthora cinnamomi Rands, is becoming a serious avocado disease problem — in Florida (5), as well as being the most serious disease in avocado-producing areas of the world (6). P. cinnamomi is most troublesome under conditions of excess moisture and where drainage is poor. Trees of any size, from nursery stock to large mature trees, may succumb to the pathogen. Since P. cinnamomi is not native to Florida (2), its importance will be directly related to its distribution. Unfortunately, the parasitic habit of this pathogen extends beyond avocado, and the host range includes over 700 species of plants (personal communication, George A. Zentmyer). Other hosts common to Florida include various species of Buxus, Camellia, Cupressus, Juniperus, Pinus, Quercus, Rhododendron, and Thuja. The importance of P. cinnamomi-free stock of avocado, as well as other hosts, cannot be overstated. The distribution of P. cinnamomi in Florida (5) is presented in fig. 1.

Fig. 1. The distribution of P. cinnamomi (isolated from avocado) in Florida.

Fig. 2. Avocado tree affected by root rot showing sparse foliage and branch die back.

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SYMPTOMS. Leaves of infected trees are smaller than normal and are yellow-green, instead of dark green. Quite often the leaves are wilted and may drop. New leaf growth is usually absent. Branches die back in advanced stages of the disease. Diseased trees frequently set an abnormally heavy crop of small fruit. Many of the small feeder roots on diseased trees are blackened and dead, whereas larger roots are seldom attacked. Some symptoms of avocado root rot in an orchard planting are shown in fig. 2. The pathogen is spread by the movement of infected avocado plants, as well as other host plants, by water moving over or through soil which contains the fungus, by cultivation equipment, and by animals including man.

CONTROL. The basis for control is pathogen-free stock. This can be achieved by hot water treatment of seed, chemical or steam treatment of planting mix, and good sanitation practices. There are no registered, effective chemicals which would offer control once plants are infected. If small areas of an orchard are affected, removal of trees and soil fumigation (with Vapam) are recommended. This will restrict its spread and enable replanting, if the fumigation is effective. Fumigation of large areas of an orchard is not practical. Plants nonsusceptible to P. cinnamomi, such as citrus or vegetable crops, can be planted. Resistant root stocks of avocado are not yet available; however, a recent report from Trinidad indicates that certain West Indian cultivars of avocado may be resistant to this pathogen (4). Successful biological control of P. cinnamomi has been reported in an avocado grove in Queensland, Australia (1). Here, the pathogen and host co-exist with low disease incidence. Microorganisms which are diverse and antagonistic to P. cinnamomi and a soil rich in organic matter, high in calcium, and slightly acid in pH are contributing factors to the biological control of the pathogen. The availability and use of moderately resistant rootstock, the production of clean nursery stock, and the employment of good agricultural practices, which would lead to natural biocontrol in the orchard, will do much to limit the potential of this pathogen. Further, procedures are available to growers through the Florida Cooperative Extension Service and the Florida Department of Agriculture and Consumer Services for the detection of P. cinnamomi in soil and in plant parts. Planting clean stock in soil that is not infested with P. cinnamomi will lessen the chance of avocado root rot becoming established.

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